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PERKINS COIE LLP				
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P.O. BOX 1247				
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EXAMINER				
ZHENG, LOIS L				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/059,907

Applicant(s)

HANSON ET AL.

Examiner

LOIS ZHENG

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26,31-33,49-52,55-60 and 93 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26,31-33,49-52,55-60 and 93 is/are rejected.
- 7) ☒ Claim(s) 55-60 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 4/23/08
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of Claims

1. Claims 26 and 49 are amended in view of applicant's amendment filed 23 April 2008. Claims 1-25, 27-30, 34-48, 53-54 and 61-92 are canceled. New claim 93 is added. Therefore, claims 26, 31-33, 49-52, 55-60 and 93 are currently under examination.

Claim Objections

2. Claims 55-60 are objected to because of the following informalities: Claims 55-60 depend on canceled claim 91. Appropriate correction is required.

In this Office Action, the instant claims 55-60 are examined based on the assumption that they depend on new claim 93.

3. The phrases "interior region" and "interior space" are interchangeably used the claims. The examiner suggests eliminating one of these phrases to make the claims more consistent across the broad.

4. In claim 26, the word "in" should be inserted between "at least one electrode adjacent to a lower end of an interior space" and "the electrode housing".

5. In claim 93, the word "region" should be added to the end of the last sentence.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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7. Claims 49-52 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 49 recites that "the pressure drop member comprising a generally conically-shaped continuous material having **no through openings**". However, the instant specification recites that the pressure drop member may be fluid permeable or only permeable to ionic species in the processing fluid (page 14, top paragraph). It is clear if the through openings as claimed are directed to large openings for passage of processing fluid, or any openings including openings in fluid permeable membrane.

Claims 50-52 are also rejected because they depend on rejected claim 49.

Claim Interpretation

8. Based on the broadest reasonable interpretation, the claimed feature “the pressure drop member comprising a generally conically-shaped continuous material having **no through openings**” as recited in claim 49 exclude fluid permeable pressure drop member since a fluid permeable pressure drop member would have implied through openings in the pressure drop member to allow process fluid to go through. Therefore, the examiner is interpreting claim 49 to be directed to a pressure drop member that is only permeable to ionic species in the processing fluid.

For the same reasons set forth above, the “permeable membrane” as recited in claims 50-51 are also interpreted to mean a membrane that is only permeable to ionic species in the processing fluid.

The applicant is invited to confirm examiner's interpretation being reflective of what applicant is intended to claim. If not, applicant is asked to amend the claims to clarify the intended claim feature.

Claim Interpretation

9. Claim 49 recites that “the pressure drop member comprising a generally conically-shaped continuous material having **no through openings**”. However, the instant specification recites that the pressure drop member may be fluid permeable or only permeable to ionic species in the processing fluid (page 14, top paragraph). Based on the broadest reasonable interpretation, the claimed feature above exclude fluid permeable pressure drop member since a fluid permeable pressure drop member would have implied openings in the pressure drop member to allow process fluid to go

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through. Therefore, the examiner is interpreting claim 49 to be directed to a pressure drop member that is only permeable to ionic species in the processing fluid.

For the same reasons set forth above, the "permeable membrane" as recited in claims 50-51 are also interpreted to mean a membrane that is only permeable to ionic species in the processing fluid.

The applicant is invited to confirm examiner's interpretation being reflective of what applicant is intended to claim. If not, applicant is asked to amend the claims to clarify the intended claim feature.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 26, 31-33, 55-60 and 93 are rejected under 35 U.S.C. 102(e) as being anticipated by Reid et al. US 6,126,798(Reid).

Reid teaches an electrochemical apparatus comprising a cup shaped plating bath with an open top(Fig. 1 #42, Fig. 2 #42A), a microelectronic workpiece support disposed proximate the open top of the processing cup(Fig. 1 # 34), one or more conductive members electrically contacting the microelectronic workpiece(col. 4 lines 27-29), an anode cup at the bottom of the processing cup for housing an anode(Fig. 2

#202) and a shaping membrane disposed over the open top of the anode cup(Fig. 2 # 208).

Regarding claim 26, the wall of the cup shaped plating bath as taught by Reid reads on the claimed one or more walls defining a processing space. The anode cup as taught by Reid reads on the claimed electrode housing. The shaping membrane as taught by Reid reads on the claimed pressure drop member. The space between the bottom of the anode cup and the shaping membrane as taught by Reid reads on the claimed interior region of the electrode housing/chamber as recited in claim 26. The space between the shaping membrane and the microelectronic workpiece as taught by Reid reads on the claimed processing space. Reid further teaches the claimed fluid inlet(Fig. 2 #200) and the claimed fluid outlet(Fig. 1 # 54) in fluid communication with the processing space.

In addition, Reid's electrochemical apparatus also comprises a plurality of fluid inlets(Fig. 2 # 220, 228 or 236) and a plurality of fluid outlet(Fig. 2 #240 or 242) in fluid communication with the interior region. Reid also teaches that these inlets are equipped with check valves. Two of these inlets(Fig. 2 #228 and 236) are connected to a pump that pumps electrolyte from an alternative source of electrolyte(col. 6 lines 46-67). Therefore, the flow to these inlets can be controlled, minimized or even reduced to zero. Based on these teachings, the examiner concludes that the electrochemical apparatus as taught by Reid is capable of being operated in a way to create a processing fluid flow path wherein the process fluid flows from the inlet 200 to the processing space, then down through the shaping membrane into the interior region of

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the electrode housing and out through the outlets 240 or 242 by closing the check valves in inlets 220, 228 and 236. Therefore, the apparatus of Reid is capable of providing the claimed processing fluid flow path, providing processing fluid into the electrode housing from a position vertically above the electrode such that processing fluid entering the electrode housing does not directly impinge on the electrode in the electrode housing.

Regarding claim 93, the apparatus of Reid comprises the claimed fluid vessel(Fig. 1 # 56 or 42), claimed anode in an anode housing(Fig. 2 #206, 202), the claimed pressure drop element(Fig. 2 #208). The space between the bottom of the anode cup and the shaping membrane as taught by Reid reads on the claimed first fluid flow region in the electrode housing. The space between the shaping membrane and the microelectronic workpiece as taught by Reid reads on the claimed second fluid flow region above the pressure drop element. Reid's electrochemical apparatus also comprises the claimed fluid inlet to provide processing fluid into both the first and second fluid flow regions(Fig. 2 # 200 and 220). Reid further teaches the claimed cathode in contact with the microelectronic workpiece while the cathode and the microelectronic workpiece are in contact with the second fluid flow region(Fig. 1 #38, col. 4 lines 27-29). In addition, by manipulating the check valve on outlet port 220 on the processing fluid inlet 200, the apparatus of Reid is inherently capable of moving substantially all processing fluid between the first and second fluid flow regions through the pressure drop element(i.e. the shaping membrane) as claimed.

Regarding claim 31, the shaped membrane as taught by Reid can be a permeable membrane as claimed(col. 9 lines 29-31).

Regarding claims 32-33, the membrane of Reid is conical in shape having an apex directed toward the interior region of the electrode housing as claimed.

Regarding claim 55, the permeable membrane as taught by Reid in view of Runsten is conical shape with an edge region of the membrane disposed closer than the central region of the membrane to the workpiece support as claimed.

Regarding claim 56-58, Reid further recites a virtual anode and a shield (Fig. 1 #53 & 55). Details of the virtual anode and the shield is described in US Patent Application No. 08/969,267, now US Patent No. 6,179,983 B1(US'983), which is incorporated into Reid(col. 4 lines 43-45). Some of the virtual anodes as described in Figs. 2-5 of US'983 with plurality of openings meet the limitations of instantly claimed flow distribution element as recited in claim 56. Fig. 6 of US'983 further teaches a shield member(# 250) between the anode and the microelectronic workpiece, and the shield having a rim and an opening disposed annularly inwardly from the rim as recited in claim 57. The shield as taught by US'983 is a field shaping element as claimed(col. 7 lines 15-34).

Regarding claim 59, Reid teaches the claimed microelectronic workpiece (Fig. 1 #38).

Regarding claim 60, the electrolyte entering the interior region of the electrode housing via any of the inlets 220, 228 and 236 as taught by Reid reads on the claimed first processing fluid. The electrolyte enters the processing space of the

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electrochemical apparatus via inlet 200 as taught by Reid reads on the claimed second processing fluid.

Response to Arguments

12. Applicant's arguments filed 23 April 2008 have been fully considered but they are not persuasive.

In the remarks, applicant argues that the processing fluid enters through inlets 220, 228 or 236 of Reid impinges directly on the anode material, which is excluded by claim 26.

The examiner does not find applicant's argument persuasive since Reid teaches that the inlets 220, 228 or 236 are equipped with check valves. In addition, the inlets 228 and 236 are connected to a pump. See paragraph 11 above. Therefore, the inlets 220, 228 or 236 can be manipulated to control the flow rate of the electrolyte or even reduce the flow rate of the electrolyte to zero. In case of zero flow rate, the inlets 220, 228 and 236 of Reid do not provide fluids that impinges directly on the anode material.

Applicant further argues that Reid does not teach or suggest that substantially all processing fluid movement between the first and second fluid flow regions passes through the pressure drop element as recited in claim 93.

The examiner does not find applicant's argument persuasive because inlet 220 of Reid is equipped with a check valve. Therefore, the fluid flow through inlet 220 of Reid can be minimized. Under such condition, the apparatus of Reid is inherently capable of moving substantially all processing fluid between the first and second fluid flow regions through the pressure drop element(i.e. the shaping membrane) as claimed.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **LOIS ZHENG** whose telephone number is (571)272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

LLZ
6/16/08